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USPT,PGPB,JPAB,EPAB,DWPI,TDBD	l5 and query\$ with dynamic with cache	2	<u>L7</u>
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USPT,PGPB,JPAB,EPAB,DWPI,TDBD	(web or internet with servers)	290578	<u>L4</u>
USPT	5444705.pn.	1	<u>L3</u>
USPT	5404537.pn.	1	<u>L2</u>
USPT	"olnowich, howard".in.	45	<u>L1</u>

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L1: Entry 11 of 45

File: USPT

Mar 28, 2000

US-PAT-NO: 6044438

DOCUMENT-IDENTIFIER: US 6044438 A

TITLE: Memory controller for controlling memory accesses across networks in distributed shared memory processing systems

DATE-ISSUED: March 28, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Olnowich; Howard Thomas	Endwell	NY	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
International Business Machines Corporation	Armonk	NY	N/A	N/A		02

APPL-NO: 8/ 890341

DATE FILED: July 10, 1997

PARENT-CASE:

CROSS-REFERENCES TO RELATED APPLICATIONS U.S. patent application Ser. No. 08/891,404, filed Jul. 10, 1997, entitle "Cache Coherent Network Adapter for Scalable Shared Memory Processing Systems", filed concurrently herewith is assigned to the same assignee hereof and contains subject matter related, in certain respects, to the subject matter of the present application; it is incorporated herein by reference.

INT-CL: [7] G06F 13/14

US-CL-ISSUED: 711/130; 711/120, 711/141, 711/150, 707/201, 709/213, 709/214

US-CL-CURRENT: 711/130; 707/201, 709/213, 709/214, 711/120, 711/141, 711/150

FIELD-OF-SEARCH: 711/120, 711/130, 711/141, 711/150, 707/201, 709/213, 709/214, 709/250

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> 4399504	August 1983	Watts et al.	N/A
<input type="checkbox"/> 4562539	December 1985	Vince	N/A
<input type="checkbox"/> 4755930	July 1988	Wilson, Jr. et al.	N/A
<input type="checkbox"/> 4965719	October 1990	Shoens et al.	N/A
<input type="checkbox"/> 5313609	May 1994	Baylor et al.	N/A
<input type="checkbox"/> 5442758	August 1995	Slingwine et al.	N/A
<input type="checkbox"/> 5444705	August 1995	Olnowich et al.	N/A
<input type="checkbox"/> 5452447	September 1995	Nelson et al.	N/A
<input type="checkbox"/> 5499349	March 1996	Nikhil et al.	N/A
<input type="checkbox"/> 5530816	June 1996	Holt	N/A
<input type="checkbox"/> 5535116	July 1996	Gupta et al.	N/A
<input type="checkbox"/> 5537569	July 1996	Masubichi	N/A
<input type="checkbox"/> 5537574	July 1996	Elko et al.	N/A
<input type="checkbox"/> 5557792	September 1996	Josten et al.	N/A
<input type="checkbox"/> 5561809	October 1996	Elko et al.	N/A
<input type="checkbox"/> 5592625	January 1997	Sandberg	N/A
<input type="checkbox"/> 5610953	March 1997	Olnowich et al.	N/A
<input type="checkbox"/> 5611049	March 1997	Pitts	N/A
<input type="checkbox"/> 5737568	April 1998	Hamaguchi et al.	N/A
<input type="checkbox"/> 5832534	November 1998	Singh et al.	711/141

OTHER PUBLICATIONS

M. Duboise et al. "Effects of Cache Coherency in Multiprocessors", IEEE Transactions on Computers, vol. C-31, No. 11, Nov. 1982.

ART-UNIT: 278

PRIMARY-EXAMINER: Lim; Krisna

ATTY-AGENT-FIRM: Beckstrand; Shelley M

ABSTRACT:

A shared memory parallel processing system interconnected by a multi-stage network combines new system configuration techniques with special-purpose hardware to provide remote memory accesses across the network, while controlling cache coherency efficiently across the network. The system configuration techniques include a systematic method for partitioning and controlling the memory in relation to local verses remote accesses and changeable verses unchangeable data. Most of the special-purpose hardware is implemented in the memory controller and network adapter, which implements three send FIFOs and three receive FIFOs at each node to segregate and handle efficiently invalidate functions, remote stores, and remote accesses requiring cache coherency. The segregation of these three functions into different send and receive FIFOs greatly facilitates the cache coherency function over the network. In addition, the network itself is tailored to provide the best efficiency for remote accesses.

16 Claims, 54 Drawing figures

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L23: Entry 4 of 23

File: USPT

Mar 20, 2001

US-PAT-NO: 6205481

DOCUMENT-IDENTIFIER: US 6205481 B1

TITLE: Protocol for distributing fresh content among networked cache servers

DATE-ISSUED: March 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Heddaya; Abdelsalam A.	Waltham	MA	N/A	N/A
Mirdad; Sulaiman A.	Rivadh	N/A	N/A	SAX
Yates; David J.	Norwood	MA	N/A	N/A
Yates; Ian C.	Boston	MA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
InfoLibria, Inc.	Waltham	MA	N/A	N/A	02

APPL-NO: 9/ 040520

DATE FILED: March 17, 1998

INT-CL: [7] G06F 15/173, G06F 15/167

US-CL-ISSUED: 709/226; 709/216, 709/223

US-CL-CURRENT: 709/226; 709/216, 709/223

FIELD-OF-SEARCH: 709/216, 709/218, 709/226, 709/230, 709/238, 709/202, 709/223, 709/104, 709/105, 711/141, 340/825.06, 707/10, 707/201, 707/203, 345/329, 345/330, 345/331

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>4897781</u>	January 1990	Chang et al.	364/200
<input type="checkbox"/>	<u>5261069</u>	November 1993	Wilkinson et al.	711/145
<input type="checkbox"/>	<u>5282201</u>	January 1994	Frank et al.	370/94.1
<input type="checkbox"/>	<u>5500860</u>	March 1996	Perlman et al.	370/85.13
<input type="checkbox"/>	<u>5511208</u>	April 1996	Boyles et al.	709/223
<input type="checkbox"/>	<u>5521913</u>	May 1996	Gridley	370/58.2
<input type="checkbox"/>	<u>5592626</u>	January 1997	Papadimitriou et al.	395/200.09
<input type="checkbox"/>	<u>5598581</u>	January 1997	Daines et al.	392/872
<input type="checkbox"/>	<u>5640504</u>	June 1997	Johnson, Jr.	395/182.02
<input type="checkbox"/>	<u>5758072</u>	May 1998	Filepp et al.	709/220
<input type="checkbox"/>	<u>5787470</u>	July 1998	DeSimone et al.	711/124
<input type="checkbox"/>	<u>5933849</u>	August 1999	Srblijic et al.	711/118

FOREIGN-PAT-NO
WO 99/48003PUBN-DATE
September 1999COUNTRY
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US-CL

OTHER PUBLICATIONS

Frivold et al., "Extending WWW for Synchronous Collaboration", SRI International, pp. 1-8, Sep. 1994.*
Vitali et al. "Using Versioning to Support Collaboration on the WWW", 4th Inter. WWW Confer., pp. 190-203, Dec. 1995.*
Gray, Stephen, "Roger Jennings' Database Workshop: Microsoft Transaction Server 2.0", Sams, Macmillan Computer Pub., excerpt pp. 1-4, Nov. 1997.*
Spectrum Software, "Special Ed. Using Microsoft Exchange Server 5.5", Que, Macmillan Computer Pub., excerpt Chapter 29, pp. 1-9, Dec. 1997.*
Anstey, David A., "High Performance Oracle8 Object-Oriented Design: Your Complete Guide to Creating Fast, Efficient Database Systems", The Coriolis Group, excerpt pp. 1-4, Feb. 1998.*
Heddaya, A. et al., "WebWave: Globally Load Balanced Fully Distributed Caching of Hot Published Documents," International Conference on Distributed Computing Systems, 1990, pp. 160-168, (1997).

ART-UNIT: 276
PRIMARY-EXAMINER: Rinehart; Mark
ASSISTANT-EXAMINER: Cardone; Jason D.
ATTY-AGENT-FIRM: Hamilton, Brook, Smith & Reynolds, P.C.

ABSTRACT:

A technique for automatic, transparent, distributed, scalable and robust replication of document copies in a computer network wherein request messages for a particular document follow paths from the clients to a home server that form a routing graph. Client request messages are routed up the graph towards the home server as would normally occur in the absence of caching. However, cache servers are located along the route, and may intercept requests if they can be serviced. In order to be able to service requests in this manner without departing from standard network protocols, the cache server needs to be able to insert a packet filter into the router associated with it, and needs also to proxy for the home server from the perspective of the client. Cache servers cooperate to update cache content by communicating with neighboring caches whenever information is received about invalid cache copies.

13 Claims, 12 Drawing figures

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L13: Entry 3 of 12

File: USPT

Dec 26, 2000

US-PAT-NO: 6167438

DOCUMENT-IDENTIFIER: US 6167438 A

TITLE: Method and system for distributed caching, prefetching and replication

DATE-ISSUED: December 26, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yates; David J.	Norwood	MA	N/A	N/A
Heddaya; Abdelsalam A.	Waltham	MA	N/A	N/A
Mirdad; Sulaiman A.	Quincy	MA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Trustees of Boston University	Boston	MA	N/A	N/A	02

APPL-NO: 8/ 861934

DATE FILED: May 22, 1997

INT-CL: [7] G06F 12/00

US-CL-ISSUED: 709/216; 709/223, 709/217, 711/118

US-CL-CURRENT: 709/216; 709/217, 709/223, 711/118

FIELD-OF-SEARCH: 711/122, 711/113, 711/118, 711/130, 709/216, 709/203, 709/217, 709/223

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>5852717</u>	December 1998	Bhide et al.	709/203
<input type="checkbox"/>	<u>5864852</u>	January 1999	Luotonen	707/10
<input type="checkbox"/>	<u>5896506</u>	April 1999	Ali et al.	709/213
<input type="checkbox"/>	<u>5924116</u>	July 1999	Aggarwal et al.	711/122
<input type="checkbox"/>	<u>5931912</u>	August 1999	Wu et al.	709/224
<input type="checkbox"/>	<u>5935207</u>	August 1999	Logue	709/219
<input type="checkbox"/>	<u>5940594</u>	August 1999	Ali et al.	709/203
<input type="checkbox"/>	<u>5941988</u>	August 1999	Bhagwat et al.	713/201

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
93/24890	December 1993	WOX	

OTHER PUBLICATIONS

Heddaya, Abdelsalam and Mirdad, Sulaiman "Wave:Wide-Area Virtual Environment for

Distributing Published Documents "ACM SIGCOMM Workshop on Middle Ware, Cambridge, MA, Aug. 28-29 (1995).
Heddaya, Abdelsalam and Mirdad, Sulaiman "WebWave: Globally Load Balanced Fully Distributed Caching of Hot Published Documents" Boston University, Computer Science Department, BU-CS-96-024, Abstract, (Oct. 15, 1996).
Heddaya, Abdelsalam, et al. "Diffusion-based Caching Along Routing Paths" Boston University, Computer Science Department Abstract, (Apr. 30, 1997).
Chankhunthod, Anawat, et al. "A Hierarchical Internet Object Cache" Proc. USENIX (1996).
Cormack, Andrew "Web Caching" Survey from UK National Cache Project, (Sep., 1996).
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"A Distributed Testbed for National Information Provisioning" NLNLR (1996).
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C. Mic Bowman et al, Harvest: a scalable, customizable discovery and access system Mar. 1995.
Marc Abrams et al, Caching Proxies: Limitations and Potentials Oct. 1995.
Heddaya, A., et al., "WebWave: Globally Load Balanced fully distributed Caching of Hot Published Documents," Technical Report BU-CS-96-024, Boston University, CS Department, (10/96), downloaded from Internet at: <http://www.cs.bu.edu/techreports/abstracts/96-024>.
Heddaya, A., et al., "WebWave: Globally Load Balanced Fully Distributed Caching of Hot Published Documents," Proceedings of the 17.sup.th International Conference on Distributed Computing Systems (Cat. No. 97CB36053), Proceedings of 17.sup.th International Conference on Distributed Computing Systems, Baltimore, MD, pp. 160-168 (May 27-30, 1997).
Shrikumar, H., et al., "Thinternet: life at the end of a tether," Computer Networks and ISDN Systems, 27 (3):375-385 (Dec. 1994).
Bolot, J., et al., "Performance engineering of the World Wide Web: Application to dimensioning and cache design," Computer Networks and ISDN Systems, 28(11):1397-1405 (May 1996).
Braun, H., et al., "Web traffic characterization: an assessment of the impact of caching documents from NCSA's web server," Computer Networks and ISDN Systems, 28(1):37-51 (Dec. 1995).

ART-UNIT: 277

PRIMARY-EXAMINER: Burgess; Glenton B.

ASSISTANT-EXAMINER: Salad; Abdullahi E.

ATTY-AGENT-FIRM: Hamilton, Brook, Smith & Reynolds, P.C.

ABSTRACT:

A technique for automatic, transparent, distributed, scalable and robust caching, prefetching, and replication in a computer network that request messages for a particular document follow paths from the clients to a home server that form a routing graph. Client request messages are routed up the graph towards the home server as would normally occur in the absence of caching. However, cache servers are located along the route, and may intercept requests if they can be serviced. In order to be able to service requests in this manner without departing from standard network protocols, the cache server needs to be able to insert a packet filter into the router associated with it, and needs also to proxy for the home server from the perspective of the client. Cache servers may cooperate to service client requests by caching and discarding documents based on its local load, the load on its neighboring caches, attached communication path load, and on document popularity. The cache servers can also implement security schemes and other document transformation features.

75 Claims, 11 Drawing figures

Structured Search

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USPT,PGPB,JPAB,EPAB,DWPI	(707/201.ccls.)	497	<u>L1</u>